



General

Guideline Title

Screening for sudden cardiac death before participation in high school and collegiate sports.

Bibliographic Source(s)

Mahmood S, Lim L, Akram Y, Alford-Morales S, Sherin K, ACPM Prevention Practice Committee. Screening for sudden cardiac death before participation in high school and collegiate sports: American College of Preventive Medicine position statement on preventive practice. Am J Prev Med. 2013 Jul;45(1):130-3. [23 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

The American College of Preventive Medicine (ACPM) supports an evaluation prior to participating in high school and collegiate sports using a standardized history and physical (H&P) (i.e., using standardized items as developed by the American Heart Association [AHA] to ensure uniformity and consistency in risk factor assessment [see the table below]). ACPM recommends against routine screening for potential sudden cardiac death (SCD) with electrocardiogram (ECG), echocardiography, and genetic testing in individuals without personal risk factors. The recommendations by ACPM address only mass screening approaches to detecting SCD and are not targeted toward individuals who may be identified by their healthcare provider as "above average" risk who may benefit from additional testing with the modalities mentioned above. ACPM supports the adoption of the National Heart, Lung, and Blood Institute (NHLBI) Working Group research agenda to evaluate the effectiveness of any screening program in reducing SCD, its cost-benefit ratio, and its impact on health outcomes (see Table 2 in the original guideline document).

Table: The 12-element AHA Recommendations for Pre-Participation Cardiovascular Screening of Competitive Athletes

Medical History^a

Personal History

1. Exertional chest pain/discomfort
2. Unexplained syncope/near-syncope^b
3. Excessive exertional and unexplained dyspnea/fatigue, associated with exercise
4. Prior recognition of a heart murmur
5. Elevated systemic blood pressure

Family History

6. Premature death (sudden and unexpected, or otherwise) before age 50 years due to heart disease, in ≥ 1 relative
7. Disability from heart disease in a close relative aged < 50 years
8. Specific knowledge of certain cardiac conditions in family members: hypertrophic or dilated cardiomyopathy, long-QT syndrome or other ion channelopathies, Marfan syndrome, or clinically important arrhythmias

Physical Examination

9. Heart murmur^c
10. Femoral pulses to exclude aortic coarctation
11. Physical stigmata of Marfan syndrome
12. Brachial artery blood pressure (sitting position)

^aParental verification is recommended for high school and middle school athletes.

^bJudged not to be neurocardiogenic (vasovagal); of particular concern when related to exertion.

^cAuscultation should be performed in both supine and standing positions (or with Valsalva maneuver), specifically to identify murmurs of dynamic left ventricular outflow tract obstruction.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Sudden cardiac death (SCD)

Guideline Category

Prevention

Risk Assessment

Screening

Clinical Specialty

Cardiology

Family Practice

Internal Medicine

Pediatrics

Preventive Medicine

Sports Medicine

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To outline the American College of Preventive Medicine's (ACPM) perspective on critical preventive medicine issues, in a timely fashion, in order to exert a positive influence on policy, practice, and research dealing with screening for sudden cardiac death (SCD) before participation in high school and collegiate sports

Target Population

Students playing high school and collegiate sports in the United States without personal risk factors

Note: This guideline does not include individuals who may be identified by their healthcare provider as "above average" risk.

Interventions and Practices Considered

Standardized history and physical (H&P):

- Personal history
- Family history
- Physical examination

Note: Electrocardiogram (ECG), echocardiography, and genetic testing were considered but not recommended.

Major Outcomes Considered

- Instances of sudden cardiac death (SCD)
- Detection of underlying cardiac conditions and disease progression
- Mortality rates
- Specificity and sensitivity of screening tests
- Cost-effectiveness of SCD screening

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

PubMed, MEDLINE, and Google Scholar were the databases used for the qualitative literature search with a time frame of 1980 to 2013. No inclusion/exclusion criteria were used in the search.

The following search terms were used:

- Sudden cardiac death
- Screening for sudden cardiac death

- Sudden cardiac death in young athletes
- Pre-participation screening of sudden cardiac death
- Cost-effectiveness of pre-participation screening of sudden cardiac death

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus

Rating Scheme for the Strength of the Evidence

Not applicable

Methods Used to Analyze the Evidence

Review

Description of the Methods Used to Analyze the Evidence

The American College of Preventive Medicine (ACPM) Prevention Practice Committee conducted a qualitative review of the literature on this topic to state the ACPM's position on sudden cardiac death screening.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The American College of Preventive Medicine (ACPM) Prevention Practice Committee reached consensus on these recommendations after an extensive literature review and examination of recommendations from other organizations.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

- A limited number of studies suggest that combining history and physical (H&P) and electrocardiogram (ECG) screening for sudden cardiac death (SCD) may be cost effective. An Italian cost-effectiveness analysis of 33,735 athletes, using a more conservative approach (10% of affected athletes would live an additional 20 years), estimated the cost per year of life saved at approximately \$20,000 for the Italian model (H&P and ECG) and about \$53,350 for the U.S. model (H&P alone).
- The American Heart Association (AHA) estimates the cost of mass ECG screening, followed by echocardiogram and other indicated testing, to be \$2.0 billion for 10 million middle and high school athletes. Pending further prospective studies involving U.S. participants, the cost effectiveness of routinely combining H&P and ECG in cardiovascular pre-participation screening in students cannot be conclusively determined.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

Description of Method of Guideline Validation

The guidelines from the following major professional and health organizations were used for comparison of recommendations on screening for sudden cardiac death before participation in high school and collegiate sports:

- American Heart Association
- European Society of Cardiologists
- International Olympic Committee
- American College of Sports Medicine

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Reduction in mortality from sudden cardiac death (SCD)

Potential Harms

Although a history and physical (H&P) costs less, requires minimal resources, and is efficient to administer, it has low sensitivity in detecting hypertrophic cardiomyopathy and other asymptomatic cardiac diseases. Another limitation is the poor utilization of a standardized H&P for pre-participation sports evaluation.

Qualifying Statements

Qualifying Statements

The American College of Preventive Medicine (ACPM) acknowledges that studies addressing the efficacy of screening with clinical outcomes are lacking and that the utility of specific screening modalities remains unclear. However, at the present time, the history and physical (H&P) is the most widely used modality for pre-participation evaluation despite its limited sensitivity in detecting certain cardiac conditions. Promoting an H&P using standardized items as that developed by the American Heart Association (AHA) will ensure uniformity and consistency in risk factor assessment (see the table in the "Major Recommendations" field).

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

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Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2013 Jul

Guideline Developer(s)

American College of Preventive Medicine - Medical Specialty Society

Source(s) of Funding

American College of Preventive Medicine (ACPM)

Guideline Committee

American College of Preventive Medicine Prevention Practice Committee

Composition of Group That Authored the Guideline

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Financial Disclosures/Conflicts of Interest

No financial disclosures were reported by the authors of this paper.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the [American College of Preventive Medicine Web site](#)

Print copies: Available from American College of Preventive Medicine, 1307 New York Ave, N.W., Suite 200, Washington, DC 20005-5603.

Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

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